Alternative Modes of Scattered Context Derivations

Abstract for the presentation in LTA 2013

Ondřej Soukup

isoukup@fit.vutbr.cz

Recent years, many studies focused on the Scattered Context Grammars (SCGs for short) were published. Except their generative power, mainly the various modifications were in the centre of interest. This study tries to look from a different perspective. The common definition of SCGs (see [2]) is preserved, however, we generalize the relation of the direct derivation. Consider the rewriting as a two phase action, first, the right hand side nonterminal is removed, second, the left hand side string is inserted into the sentential form. Nevertheless, these actions do not have to be performed on the same place of the sentential form. We introduce several new derivation modes, which define various restrictions, but also bring new nondeterminism. It is proved that the generative power is not influenced.

Our work and especially the proofs of generative power are strongly based on [1]. This paper introduces elegant way how to define SCG for any recursively enumerable language. We use very similar approach with only small changes to avoid potentially negative influence of the used modes to preserve the language.

Since many of the defined modes have some similarities and the proofs are complex and thus long, the presentation is concentrated on the principles to give a basic idea. Only some modes are introduced and the main parts of the selected proof are outlined.

References

[1] Fernau, H., Meduna, A.: A simultaneous reduction of several measures of descriptional complexity in scattered context grammars. Information Processing Letters 86(5), 235–240 (2003)

[2] Meduna, A., Techet, J.: Scattered Context Grammars and their Applications. WIT Press (2010), ISBN: 978-1-84564-426-0